



Body System: Respiratory		
Session Topic: Fungal Respiratory Infections		
Educational Format		Faculty Expertise Required
REQUIRED	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
OPTIONAL	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. <u>Please describe your interest and plan for teaching a PBL on your proposal form.</u>
Professional Practice Gap	Learning Objective(s) that will close the gap and meet the need	Outcome Being Measured
<ul style="list-style-type: none"> Knowledge gaps in being aware of trends in emerging and re-emerging infectious diseases, including classifications by the NIAID and research activities to explain emergence/re-emergence of certain diseases. Knowledge gaps regarding the education of staff about appropriate infection control guidelines to take and necessary vaccinations (such as for seasonal and novel influenza) for healthcare workers who may be exposed to certain EIDs. Knowledge gaps in understanding the public health implications of infectious disease outbreaks, particularly the reporting mechanisms to local or state agencies and the importance of surveillance of notifiable 	<ol style="list-style-type: none"> Recognize the diagnostic clues for likely pulmonary fungal infection. Determine appropriate first-line options for common fungal pulmonary pathogens. Establish protocols for identifying patients at risk for having an undiagnosed pulmonary fungal infection. Coordinate referral and follow up with allergist/immunologist, as indicated by the initial diagnosis. 	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.



<p>conditions.</p> <ul style="list-style-type: none"> • This is some evidence that valley fever (coccidioidomycosis) may be under-recognized. • Newer diagnostic methods are available for the diagnosis of fungal infections. • There are various updated guidelines on the diagnosis, treatment, and management of fungal infections. • There are newly FDA approved antifungal treatments available. 		
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ACGME Core Competencies Addressed (select all that apply)

X	Medical Knowledge		Patient Care
	Interpersonal and Communication Skills		Practice-Based Learning and Improvement
	Professionalism		Systems-Based Practice

Faculty Instructional Goals

Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.

- Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations
- Facilitate learner engagement during the session
- Address related practice barriers to foster optimal patient management
- Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the References section below are a good place to start
 - Visit <http://www.aafp.org/journals> for additional resources
 - Visit <http://familydoctor.org> for patient education and resources
- Provide recommendations for recognizing the diagnostic clues for likely pulmonary fungal infection.
- Provide recommendations for determine appropriate first-line options for common fungal pulmonary pathogens, including an overview of the safety and efficacy of newly FDA approved treatments.
- Provide recommendations for establishing protocols for identifying patients at risk for having an undiagnosed pulmonary fungal infection, particularly among immunocompromised, adult pulmonary and critical care patients.



- Provide strategies and resources for coordinating referral and follow up with allergist/immunologist, as indicated by the initial diagnosis.

Needs Assessment

Respiratory fungal infections were considered rare and some were considered not pathogenic but we are finding a number of fungal infections causing significant lung disease. In fact, fungal infections frequently are overlooked etiologies of lung infection and community-acquired pneumonia.¹ The mortality rate among patients with these infections is estimated at 10% because diagnosis often is delayed. Patients with uncompromised immune systems account for 87% of mortalities from endemic mycoses.²

Respiratory fungal infections were considered rare and some were considered not pathogenic but we are finding a number of fungal infections causing significant lung disease. Invasive fungal infections cause substantial morbidity and mortality; however, antifungal resistance is becoming an emerging public health problem.³ In the primary care setting, physicians should be prepared to diagnose and treat pulmonary cryptococcal, histoplasmosis, coccidioidomycosis (Valley Fever), pulmonary aspergillosis, pneumocystis pneumonia, candida, and fungal rhinosinusitis.²

Data from a recent American Academy of Family Physicians CME Needs Assessment survey indicates that family physicians have statistically significant knowledge gaps in the medical knowledge necessary to order and interpret diagnostic tests for the diagnosis of respiratory fungal infections; the management of infectious diseases generally; as well as having knowledge gaps in managing certain aspects of pulmonary function testing, cough, chronic obstructive pulmonary disease, upper respiratory infections, asthma, or immunocompromised patients that may pose challenges in diagnosing and treating those with respiratory fungal infections.⁴ More specifically, CME outcomes data from the 2011 AAFP Scientific Assembly sessions: *Emerging Infections and Infectious Diseases: The Threat of Hospital-acquired Infections*, indicate that family physicians require continuing education on specific treatment choices for different infections, resistant hospital infections that spread to the community, and specific information about current emerging infections.⁵

A review of the literature identifies the following physician knowledge and practice gaps:

- This is some evidence that valley fever (coccidioidomycosis) may be under-recognized.⁶
- Newer diagnostic methods are available for the diagnosis of fungal infections.^{2,7}
- There are updated guidelines on the treatment of fungal infections in adult pulmonary and critical care patients from the American Thoracic Society.⁸
- There are updated guidelines for the management of cryptococcal disease from the Infectious Diseases Society of America (IDSA).⁹
- There are updated ACR Appropriateness Criteria® for the radiologic management of thoracic nodules and masses.¹⁰
- There are updated ACR Appropriateness Criteria® for acute respiratory illness in immunocompromised patients.¹¹
- There are updated consultation and referral guidelines from the American Academy of Allergy, Asthma & Immunology (AAAAI).¹²
- There are newly FDA approved antifungal treatments available.¹³



References

1. Hage CA, Knox KS, Wheat LJ. Endemic mycoses: overlooked causes of community acquired pneumonia. *Respiratory medicine*. Jun 2012;106(6):769-776.
2. Choby B, Hunter P. Respiratory Infections. In: Clarke SL, ed. Vol #429. Leawood KS: AAFP; 2014. Accessed July 2015.
3. Centers for Disease Control and Prevention. Antifungal Resistance. *Fungal Diseases* 2014; <http://www.cdc.gov/fungal/antifungal-resistance.html>. Accessed Apr, 2015.
4. AAFP. 2012 CME Needs Assessment: Clinical Topics. American Academy of Family Physicians; 2012.
5. American Academy of Family Physicians (AAFP). 2011 AAFP Scientific Assembly: CME Outcomes Report. Leawood KS: AAFP; 2011.
6. Centers for Disease Control and Prevention. Valley Fever (Coccidioidomycosis) Statistics. *Fungal Diseases* 2014; <http://www.cdc.gov/fungal/diseases/coccidioidomycosis/statistics.html>. Accessed Apr, 2015.
7. Hazen KC. Respiratory fungal infections: molecular diagnostic tests. *Clinics in laboratory medicine*. Jun 2014;34(2):351-364.
8. Limper AH, Knox KS, Sarosi GA, et al. An official American Thoracic Society statement: treatment of fungal infections in adult pulmonary and critical care patients. *American journal of respiratory and critical care medicine*. 2011;183(1):96-128.
9. Perfect JR, Dismukes WE, Dromer F, et al. Clinical practice guidelines for the management of cryptococcal disease: 2010 update by the Infectious Diseases Society of America. *Clinical infectious diseases*. 2010;50(3):291-322.
10. Ray CE, English B, Funaki BS, et al. ACR appropriateness criteria® radiologic management of thoracic nodules and masses. *Journal of the American College of Radiology*. 2012;9(1):13-19.
11. Heitkamp DE, Mohammed T-LH, Kirsch J, et al. ACR Appropriateness Criteria® Acute Respiratory Illness in Immunocompromised Patients. *Journal of the American College of Radiology*. 2012;9(3):164-169.
12. American Academy of Allergy A, Immunology. Consultation and referral guidelines citing the evidence: how the allergist-immunologist can help. *The Journal of allergy and clinical immunology*. Feb 2006;117(2 Suppl Consultation):S495-523.
13. CenterWatch. FDA Approved Drugs by Medical Condition. 2015; <https://www.centerwatch.com/drug-information/fda-approved-drugs/medical-conditions/>. Accessed June, 2015.